Amendments to Claims:

This listing of claims will replace all prior revisions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for reducing sensed physical variables including the steps of:

a) generating a plurality of control commands as a function of the sensed physical variables;

b) generating an estimate of a relationship between the sensed physical variables and the control commands, wherein the estimate is used in said step a) in generating the plurality of control commands;

c) updating the estimate of the relationship in said step b) based upon a response by the sensed physical variables to the control commands, wherein the control command in said step a) includes a normalization factor on ~~the~~ a convergence rate that depends on said estimate in step b), and wherein said normalization factor is updated based on the update to the estimate.

2. (Original) The method according to Claim 1 wherein iterations of said step a) are performed at a control rate, and wherein said step c) further includes the steps of:

d) determining a Cholesky decomposition; and

e) reducing the computations per iteration of said step a) by splitting the Cholesky decomposition over more than one of said iterations.

3. (Original) The method according to Claim 2, further including the steps of:

f) generating a matrix of sensed physical variable data (z_k); and

g) generating a matrix of control command data (u_k), wherein $\Delta z_k = T\ \Delta u_k$, and where T is a matrix representing said estimate.

4. (Original) The method according to Claim 3, further including the step of:

h) updating the T matrix according to $T_{k+1} = T_k + EK^H$

where K is a gain matrix and E is residual vector formed as $E = y - Tv$, and where $y_k = \Delta z_k$, and $v_k = \Delta u_k$.

5. (Original) The method according to Claim 1, wherein iterations of said step a) are performed at a control rate, and wherein said step c) further includes the step of updating a normalization factor on a convergence rate of the function in said step a).

6. (Original) A method for reducing sensed physical variables including the steps of:

a) generating a plurality of control commands as a function of the sensed physical variables based upon an estimate of a relationship between the sensed physical variables and the control commands; and

b) updating the estimate of the relationship in said step a) based upon a response by the sensed physical variables to the control commands by treating the updating of the estimate as a portion of a QR decomposition and solving the QR decomposition.

7. (Original) The method according to Claim 6, wherein said steps a) and b) include adaptive quasi-steady control logic as a function of $\Delta u_n = -(T_n{*}T_n+W)^{-1}{*}T^T{}_n{*}y_n$.

8. (Original) The method according to Claim 7 further comprising:

reformulating the adaptive quasi-steady control logic into the QR decomposition.

9. (Original) The method according to Claim 8, wherein the adaptive quasi-steady control logic uses a square root algorithm in which theoretically negative feedback gains are computed as negative feedback gains.

10. (Original) The method according to Claim 9, further comprising:

propagating an estimate of a physical variable Y_n as a function of $Y_n=(W+T_n{}^TT_n)^{-1}$.

11. (Currently Amended) A system for controlling a plurality of sensed physical variable comprising:

a plurality of sensors for measuring the physical variables;

a control unit generating an estimate of a relationship between the sensed physical variables and a plurality of control commands, and generating the plurality of control commands over time based upon the sensed physical variables and based upon the relationship; and

a plurality of force generators activated based upon said plurality of command signals;

wherein the control unit updates the estimate of the relationship based upon a response by the sensed physical variables to the control commands, wherein the control command includes a normalization factor on ~~the~~ a convergence rate that depends on said estimate, and wherein said normalization factor is updated based on the update to the estimate.

12. (Previously Presented) The system according to Claim 11 wherein the control unit iteratively generates an estimate of the relationship at a control rate, and wherein the control unit updates the relationship by determining a Cholesky decomposition and by reducing the computations per iteration of generating the estimate of the relationship by splitting the Cholesky decomposition over more than one of said iterations.

13. (Previously Presented) The system according to Claim 12, wherein the control unit generates a matrix of sensed physical variable data (z_k) and generates a matrix of control command data (u_k), wherein $\Delta z_k = T \Delta u_k$, and where T is a matrix representing said estimate.

14. (Previously Presented) The system according to Claim 13, wherein the control unit updates the T matrix according to $T_{k+1} = T_k + EK^H$, where K is a gain matrix and E is residual vector formed as $E = y - Tv$, and where $y_k = \Delta z_k$, and $v_k = \Delta u_k$.

15. (Previously Presented) The system according to Claim 11, wherein the control unit iteratively generates control commands at a control rate, and wherein the control unit updates a normalization factor on a convergence rate of the function.

16. (Previously Presented) A system for controlling a plurality of sensed physical variable comprising:

a plurality of sensors for measuring the physical variables;

a control unit generating an estimate of a relationship between the sensed physical variables and a plurality of control commands, and generating the plurality of control commands over time based upon the sensed physical variables and based upon the relationship, the control unit updating the estimate of the relationship based upon a response by the sensed physical variables to the control commands by treating the updating of the estimate as a portion of a QR decomposition and solving the QR decomposition.

17. (Previously Presented) The system according to Claim 16, wherein the control unit includes adaptive quasi-steady control logic as a function of $\Delta u_n = -(T_n{}^*T_n+W)^{-1}{}^*T^T{}_n{}^*y_n$.

18. (Previously Presented) The system according to Claim 17 wherein the control unit reformulates the adaptive quasi-steady control logic into the QR decomposition.

19. (Previously Presented) The system according to Claim 18, wherein the adaptive quasi-steady control logic uses a square root algorithm in which theoretically negative feedback gains are computed as negative feedback gains.

20. (Previously Presented) The system according to Claim 19, wherein the control unit propagates an estimate of a physical variable Y_n as a function of $Y_n=(W+T_n^T T_n)$.

21. (New) A method for reducing sensed physical variables including the steps of:

a) generating a matrix of sensed physical variable data (z_k);

b) generating a matrix of control command data (u_k), wherein $\Delta z_k = T\ \Delta u_k$, and where T is a matrix representing an estimate of a relationship between the sensed physical variables and the plurality of control commands;

c) updating the T matrix according to $T_{k+1} = T_k + EK^H$

where K is a gain matrix and E is residual vector formed as $E = y - Tv$, and where $y_k = \Delta z_k$, and $v_k = \Delta u_k$, wherein the control commands in said step b) include a normalization factor on a convergence rate that depends on the T matrix, and wherein said normalization factor is updated based on the update to the T matrix.